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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : A61K 31/415

A1

(11) International Publication Number: WO 93/00089

(43) International Publication Date: 7 January 1993 (07.01.93)

(21) International Application Number: PCT/US92/05135

(22) International Filing Date: 17 June 1992 (17.06.92)

(30) Priority data:
9113517.8 21 June 1991 (21.06.91) GB

(71) Applicant *(for all designated States except US)*: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)* : DU REAU, Charles [FR/GB]; 18 Garrick Close, London SW18 1JJ (GB). STEWART FISH, Karen [GB/GB]; 8 Aragon Court, Rectory Close, Bracknell, Berkshire RG12 7AS (GB).

(74) Agents: HUGHETT, Eileen, L. et al.; The Procter & Gamble Company, Ivorydale Technical Center, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087 (US).

(81) Designated States: AU, BB, BG, BR, CA, CS, FI, HU, JP, KP, KR, LK, MG, MN, MW, NO, PL, RO, RU, SD, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG).

Published
With international search report.

(54) Title: CLEANSING PRODUCTS

(57) Abstract

A foam-producing cleansing product comprising a pump-actuated non-aerosol dispenser equipped with a reservoir, dispensing head, pump means and liquid/air mixing means, wherein the reservoir contains an aqueous cleansing composition comprising: (a) from about 0.1 to 16 % of an imidazolinium or ammonium amphoteric surfactant, (b) from 0.1 to 16 % of an aminoalkanoate or iminodialkanote amphoteric surfactant, (c) optionally up to 10 % anionic surfactant, and (d) water wherein the cleansing composition has a total surfactant concentration of from 0.2 % to 20 % of which at least 20 % comprises the mixture of (a) and (b). The composition has improved foam stability and creaminess together with excellent cleansing performance and mildness. It is suitable for use as make-up and facial cleansers, foam and shower produits, shampoos etc.

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CLEANSING PRODUCTS

The present invention relates to cleansing products. In particular, it relates to foam-producing personal cleansing products suitable for cleansing the skin and/or the hair and which may be used, for example, in the form of make-up removal and facial cleansers, foam bath preparations, shower products, shampoos etc. The cleansing products are also suitable for other applications requiring the generation of a stable foam. The invention also relates to cleansing products containing functional components such as antibacterial agents and which display improved efficacy.

Foaming cosmetic compositions must satisfy a number of criteria including cleansing power, foaming properties and mildness/low irritancy with respect to the skin, hair and the occular mucosae.

Skin is made up of several layers of cells which coat and protect the keratin and collagen fibrous proteins that form the skeleton of its structure. The outermost of these layers, referred to as the stratum corneum, is known to be composed of 250 Å protein bundles surrounded by 80 Å thick layers. Anionic surfactants can penetrate the stratum corneum membrane and, by delipidization (i.e. removal of the lipids from the stratum corneum), destroy its integrity. This destruction of the skin surface topography leads to a rough feel and may eventually permit the surfactant to interact with the keratin, creating irritation.

Ideal cosmetic cleansers should cleanse the skin or hair gently, causing little or no irritation without defatting and or drying the skin and without leaving skin taut after frequent use. Most lathering soaps, liquids and bars fail in this respect.

Certain synthetic surfactants are known to be mild. However, a major drawback of most mild synthetic surfactant systems when formulated for skin cleansing is poor lather performance compared to the highest bar soap standards (bars which are rich in coconut soap and superfatted). On the other hand, the use of known high sudsing anionic surfactants with lather boosters can yield acceptable lather volume and quality. Unfortunately, however, the highest sudsing anionic surfactants are, in fact, poor in clinical skin mildness. Surfactants that are among the mildest, such as sodium lauryl glyceryl ether sulfonate, (AGS), are marginal in lather. These two facts make the surfactant selection, the lather and skin feel benefit formulation process a delicate balancing act.

Rather stringent requirements for cosmetic cleansers limit the choice of surface-active agents, and final formulations represent some degree of compromise. Mildness is often obtained at the expense of effective cleansing, or lathering may be sacrificed for either mildness, product stability, or both.

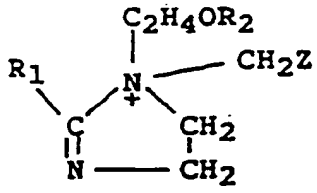
Thus a need exists for cleansing products which will produce a foam which is abundant, stable and of high quality (compactness), which are effective skin and hair cleansers and which are very mild to the skin, hair and occular mucosae.

The use of aqueous skin cleansing compositions in so-called "non-pressurized", aerated foaming cleanser products is disclosed in US-A-3962150. A need exists, however, for foam-producing cleanser products which will provide superior foam stability and creaminess simultaneously with excellent mildness, product stability and ease-of-use characteristics over the full range of usage and temperature conditions. A need also exists for personal cleansing products which will provide improved

antibacterial performance.

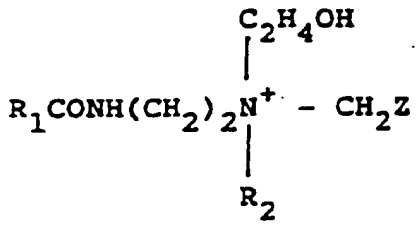
The subject of the present invention is a foam-producing cleansing product suitable for personal cleansing of the skin or hair and which may be used as make-up removal and facial cleansers, foam bath and shower products, shampoos etc. The product comprises a pump-actuated non-aerosol dispenser equipped with a reservoir, dispensing head, liquid/air mixing means and preferably homogenizing means and non-return valve means. In the reservoir, there is contained in one aspect of the invention an aqueous cleansing composition comprising:

(a) from about 0.1% to about 16% by weight of a first amphoteric surfactant selected from imidazolinium derivatives of formula I



I

wherein R_1 is C_7-C_{22} alkyl or alkenyl, R_2 is hydrogen or CH_2Z, each Z is independently CO_2M or CH_2CO_2M, and M is H, alkali metal, alkaline earth metal, ammonium or alkanolammonium; and/or ammonium derivatives of formula IV



IV

wherein R_1, R_2 and Z are as defined above;

(b) from about 0.1% to about 16% by weight of a second amphoteric surfactant selected from aminoalkanoates of formula II

$$R_1NH(CH_2)_nCO_2M \qquad II$$

iminodialkanoates of formula III

$$R_1N[(CH_2)_mCO_2M]_2 \qquad III$$

and mixtures thereof, wherein n and m are numbers from 1 to 4, and R_1 and M are independently selected from the groups specified in (a) above;

(c) optionally up to about 10% of anionic surfactant; and

(d) water;

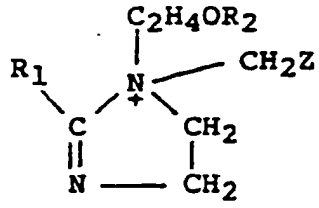
wherein the cleansing composition has a total surfactant concentration of from about 0.2% to about 20% by weight and wherein the combined concentration of the first and second amphoteric surfactants comprises at least 20% by weight of the total surfactant concentration.

All concentrations and ratios herein are by weight of the cleansing composition, unless otherwise specified.

The invention relates to a foam-producing cleansing product with superior lathering characteristics (creaminess, abundance, stability) combined with excellent mildness, stability, cleansing ability and germicidal performance. In one aspect of the invention, the cleansing product comprises a cleansing composition in the form of an aqueous liquid comprising a defined mixture of amphoteric surfactants packaged within a so-called

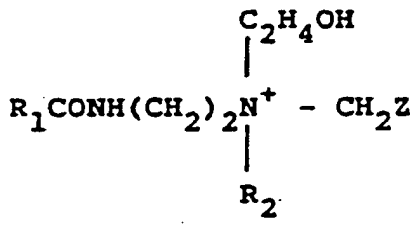
"pump foamer" container - pump-actuated dispenser equipped with a dispensing head and liquid/air mixing means, from which the cleansing composition can be easily dispensed in the form of an aqueous foam by manual pumping. The essential and optional features of the product of this aspect of the invention are indicated below.

The cleansing compositions preferred for use herein comprise a mixture of two amphoteric surfactants, a first amphoteric surfactant being selected from imidazolinium surfactants of formula I



I

wherein R_1 is C_7-C_{22} alkyl or alkenyl, R_2 is hydrogen or CH_2Z, each Z is independently CO_2M or CH_2CO_2M, and M is H, alkali metal, alkaline earth metal, ammonium or alkanolammonium; and/or ammonium derivatives of formula IV

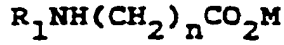


IV

wherein R_1, R_2 and Z are as defined above;

and a second amphoteric surfactant being selected from:

aminoalkanoates of formula II



II

iminodialkanoates of formula III

$$R_1N[(CH_2)_mCO_2M]_2 \qquad III$$

and mixtures thereof, wherein n and m are numbers from 1 to 4, and R_1 and M are independently selected from the groups specified above.

The cleansing compositions for use herein can also comprise other, preferably mild, surfactant components, notably, anionic surfactants. Preferred herein, however, are compositions in which the combined concentration of the first and second amphoteric surfactants is at least about 20%, and preferably at least about 50% by weight of the total surfactant concentration, this being desirable from the viewpoint of achieving optimum lathering characteristics. In preferred compositions, the mixture of the first and second amphoteric surfactants comprises at least about 60%, more preferably at least about 75% by weight of the total surfactant.

Suitable amphoteric surfactants of the first type are marketed under the trade name Miranol and are understood to comprise a complex mixture of species. Traditionally, the Miranols have been described as having the general formula I, although the CTFA Cosmetic Ingredient Dictionary, 3rd Edition indicates the non-cyclic structure IV. In practice, a complex mixture of cyclic and non-cyclic species is likely to exist and both definitions are given here for sake of completeness.

Examples of suitable amphoteric surfactants for use as the first amphoteric surfactant include compounds of formula I and/or IV in which R_1 is C_8H_{17} (especially iso-capryl), C_9H_{19} and $C_{11}H_{23}$ alkyl. Especially preferred are the compounds in which R_1 is C_9H_{19}, Z

is CO_2M and R_2 is H; and the compounds in which R_1 is $C_{11}H_{23}$, Z is CO_2M and R_2 is H or CH_2CO_2M.

It will be understood that a number of commercially-available amphoteric surfactants of this type are manufactured and sold in the form of complexes with anionic surfactants, especially those of the sulfated C_8-C_{18} alcohol, C_8-C_{18} ethoxylated alcohol or C_8-C_{18} acyl glyceride types. In one aspect of the invention therefore, the compositions comprise a premix or complex of the first amphoteric surfactant and anionic surfactant in an equivalent ratio of about 1:1 in order to provide approximate electroneutrality.

Examples of suitable amphoteric surfactants for use as the second amphoteric surfactant include salts, especially the triethanolammonium salts and salts of N-lauryl-beta-amino propionic acid and N-lauryl-imino-dipropionic acid.

The cleansing compositions preferably contain from about 0.5% to about 10% by weight, more preferably from about 0.5% to about 4% by weight of each of the first and second amphoteric surfactants. The weight ratio of first amphoteric surfactant : second amphoteric surfactant is preferably from about 10:1 to about 1:10, more preferably from about 5:1 to about 1:5, especially from about 3:1 to about 1:3.

The compositions of the invention can comprise or be supplemented by surfactants other than the amphoteric surfactants specified above. However, the total level of surfactant in the compositions herein should generally lie in the range from about 0.2% to about 20% by weight, preferably from about 1% to about 16%, more preferably from about 1% to about 8% and especially from about 2% to about 6% by weight. It is a feature of the products of

the invention that they can provide excellent foam stability and creaminess, even at low levels of cleansing surfactant.

A preferred optional surfactant in the compositions herein is an anionic surfactant. This is preferably present in a level of from about 0.1 to 10%, more preferably from about 0.5 to 5% and especially from about 1% to about 3% by weight. Preferred anionic surfactants for inclusion herein, other than alkyl sulfates, ethoxylated alkyl sulfates and acylglyceride sulfates mentioned above, are the fatty acid condensation products of proteins, degraded proteins or amino acids or mixtures of such condensation products. In highly preferred embodiments, the fatty acid condensation products are selected from:

(i) condensation products of C_8-C_{12}, preferably C_{10}-C_{18} fatty acids with hydrolysed proteins,

(ii) fatty acid sarcosinates derived from C_8-C_{22}, preferably C_{10}-C_{18} fatty acids, and

(iii) mixtures thereof.

Other suitable mild synthetic detergent surfactants useful in the cleansing compositions include methyl acyl taurates; fatty acyl glycinates; N-acyl glutamates; alkyl glucosides; alkyl glycerides and ethoxylated glycerides; acyl isethionates; alkyl sulfosuccinates; alpha-sulfonated fatty acids, their salts and/or their esters; alkyl phosphate esters; ethoxylated alkyl phosphate esters; alkyl ether sulfates; glucose esters and alkylated, e.g., methyl glucose esters; mixtures of alkyl ether sulfates and alkyl amine oxides; betaines; sultaines; and mixtures thereof. Included in the surfactants are the alkyl ether sulfates with up to 12 ethoxy groups, especially ammonium

and sodium lauryl ether sulfates. Alkyl and/or acyl chain lengths for these surfactants are C_8-C_{22}, preferably C_{10}-C_{18}.

Suitable mild synthetic detergent surfactants of these types include:
C_8-C_{18} monoalkyl phosphate salts, preferably at least partly in the form of their polyalkanol, e.g., N,N,N'N'-tetraethanol-(ethylenediamine) (Quadrol) salts; N-(C_8-C_{18} fatty acyl) glutamates; C_8-C_{18} fatty acyl glycinates and/or their mixtures with additional anionic synthetic detergent surfactant, and/or mixtures thereof.

The compositions of the invention preferably also contain a polymeric thickener at a level from about 0.01% to about 5%, preferably from about 0.04% to about 2% and especially from about 0.05% to about 1%. The polymeric thickener is found to be valuable for enhancing the creaminess and quality of the foam without adversely affecting product dispensing characteristics.

In general, the useful polymers should be either soluble or dispersible in water to a level that will raise the viscosity of the corresponding polymer-free composition at least about 1 cps and preferably by from about 2 to about 10 cps, more preferably from about 2 to about 5 cps at 70°F (21.2°C). Suitable polymers are high molecular weight materials (mass-average molecular weight determined, for instance, by light scattering), being generally from about 2,000 to about 3,000,000, preferably from about 5,000 to about 1,000,000 and more preferably from about 7,000 to about 1,000,000). Since the polymers apparently operate by raising the viscosity of the compositions, the polymers preferably have a thickening ability such that a 1% dispersion of the polymer in water at 70°F (21.2°C) exceeds about 1 centipoise, preferably

about 2 centipoise.

Useful polymers are the cationic, nonionic, amphoteric, and anionic polymers useful in the cosmetic field. Preferred are cationic and nonionic polymers used in the cosmetic field as hair or skin conditioning agents.

Representative classes of polymeric hair or skin conditioning agents include cationic and nonionic polysaccharides; cationic and nonionic homopolymers and copolymers derived from acrylic and/or methacrylic acid; cationic and nonionic cellulose resins; cationic copolymers of dimethyldiallylammonium chloride and acrylic acid; cationic homopolymers of dimethyldiallylammonium chloride; cationic polyalkylene and ethoxypolyalkylene imines; quaternized silicones, and mixtures thereof.

By way of exemplification, cationic polymeric conditioning agents preferred for use herein include cationic guar gums such as hydroxypropyl trimethyl ammonium guar gum (d.s. of from 0.11 to 0.22) available commercially under the trade names Jaguar C-14-S(RTM) and Jaguar C-17(RTM), and also Jaguar C-16(RTM), which contains hydroxypropyl substituents (d.s. of from 0.8 - 1.1) in addition to the above-specified cationic groups, and quaternized cellulose ethers available commercially under the trade names Ucare Polymer JR and Celquat. Other suitable cationic polymers are homopolymers of dimethyldiallylammonium chloride available commercially under the trade name Merquat 100, copolymers of dimethyl aminoethylmethacrylate and acrylamide, copolymers of dimethyldiallylammonium chloride and acrylamide, available commercially under the trade names Merquat 550 and Merquat S, quaternized vinyl pyrrollidone acrylate or methacrylate copolymers of amino alcohol available commercially under the trade name Gafquat, and polyalkyleneimines such as polyethylenimime and

ethoxylated polyethylenimine.

Other polymers suitable for the use herein include hydroxyethyl cellulose (e.g. Natrosol 250MXR, Natrosol 250HHR); xanthan gum (e.g. Keltrol T); polymers of saccharides or oligogosaccharides with compatible synthetic monomers; quaternized polycarboxylates; polyethyleneglycol mono-and di-esters/ethers (e.g. polyethyleneglycol [20-500] distearate).

The cleansing compositions can optionally include a hair or skin moisturizer. The preferred level of moisturizer is from about 3% to about 40% by weight. In preferred embodiments, the moisturizer is nonocclusive and is selected from:

1. water-soluble liquid polyols;
2. essential amino acid compound found naturally occuring in the stratum corneum of the skin; and
3. water-soluble nonpolyol nonocclusives and mixtures thereof.

Some examples of more preferred nonocclusive moisturizers are glycerine, polyethylene glycol, propylene glycol, sorbitol, polyethylene glycol and propylene glycol ethers of methyl glucose (e.g. methyl glucan-20), polyethylene glycol and propylene glycol ethers of lanolin alcohol (e.g. Solulan-75), sodium pyrrolidone carboxylic acid, lactic acid, urea, L-proline, guanidine, pyrrolidone and mixtures thereof. Of the above, glycerine is highly preferred.

Examples of other water-soluble nonocclusive moisturizers include water-soluble hexadecyl, myristyl, isodecyl or isopropyl esters of adipic, lactic, oleic, stearic, isostearic, myristic or linoleic acids, as well as many of their corresponding alcohol esters (sodium

isostearoly-2-lactylate, sodium capryl lactylate), hydrolyzed protein and other collagen-derived proteins, aloe vera gel and acetamide MEA.

Another valuable feature of the invention is the surprising finding that the efficacy of cleansing compositions which incorporate a functional component such as an antibacterial or germicidal agent is substantially enhanced by incorporation of the cleansing composition within an aerated foaming cleansing pack. In particular, functional components which are essentially insoluble in water but which are solubilized in the cleansing composition, preferably in the form of an isotropic micellar solution, have been found to display superior surface deposition and substantivity characteristics and improved efficacy. According to a second aspect of the invention, therefore, there is provided a personal cleansing composition packaged in a pump foamer container in which the composition comprises from about 0.5% to about 16% of a surfactant (synthetic, soap or mixture thereof), and from about 0.01% to about 5%, preferably from about 0.1% to about 4% by weight of a preferably water-insoluble functional component such as an antibacterial agent.

Antibacterial agents suitable for use herein include 3,4-di- and 3,4',5-tribromosalicylanilides, 4,4'-dichloro-3-(trifluoromethyl) carbanilide, 3,4,4'-trichlorocarbanilide, phenoxyethanol, phenoxypropanol, chlorhexidine salts, hexamidine salts, 2',4,4'-trichloro-2-hydroxy-diphenyl ether (Trichlosan), 2,2'-methylene bis (4-chloro-6-bromophenol), salicylic acid, parachlorometaxylenol, 1-hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2-(1H)-pyridone salts (Octopirox) and mixtures thereof. In the case of water-insoluble antibacterial agents, a solubilizer (e.g. propylene glycol) is preferably also added at a level of

from about 0.1% to about 5% by weight.

A number of additional optional materials can be added to the cleansing compositions. Such materials include proteins and polypeptides and derivatives thereof; water-soluble or solubilizable preservatives such as Germall 115, methyl, ethyl, propyl and butyl esters of hydroxybenzoic acid, EDTA, Euxyl (RTM) K400, Bronopol (2-bromo-2-nitropropane-1,3-diol); other moisturizing agents such as hylaronic acid, chitin, and starch-grafted sodium polyacrylates such as Sanwet (RTM) IM-1000, IM-1500 and IM-2500 available from Celanese Superabsorbent Materials, Portsmith, VA, USA and described in USA-A-4,076,663; solvents such as hexylene glycol and propylene glycol; low temperature phase modifiers such as ammonium ion sources (e.g. NH_4Cl); colouring agents; perfumes and perfume solubilizers etc. Conventional nonionic emollients can be included as additional skin conditioning agents at levels up to about 10%, preferably from about 1% to about 6%. Such materials include, for example, mineral oils, fatty sorbitan esters (see US-A-3988255, Seiden, issued October 26th 1976), lanolin and lanolin derivatives, esters such as isopropyl myristate and triglycerides such as coconut oil. Water is also present at a level of from about 60% to about 99% preferably at least about 75% by weight of the compositions herein.

The pH of the compositions is preferably from about 4 to about 9, more preferably from about 4.5 to about 8.5, pH being controlled, for example, using a citrate buffer system.

The cleansing compositions herein are packaged in a pump-actuated non-aerosol dispenser of the so-called "pump-foamer" type which comprise a reservoir, a dispensing head, pump means, liquid/air mixing means and preferably homogenising means and non-return valve means.

Highly preferred for use herein is a pump foamer pack as described in Japanese Utility Model 1-66900. In brief, the pump foam dispenser comprises a manually actuated, spring-mounted piston tube arranged for reciprocal, up and down movement within an air/liquid cylinder, wherein the piston tube and the upper large diameter part of the cylinder together act as an air pump and wherein the piston tube and the lower, small diameter part of the cylinder together act as a liquid pump. The liquid and air pumps are synchronized by the common piston mechanism. The pumping action is controlled by means of three check valves, a first check valve which regulates entry of liquid from the reservoir into the liquid cylinder, a second check valve which regulates entry of air into the air cylinder, and a third check valve which regulates discharge of liquid from the liquid cylinder to a liquid/air mixing chamber. The liquid/air mixing chamber preferably includes a homogenizing means which makes the generated foam more homogeneous and controls the consistency of the foam. The foam is then discharged as a uniform non-pressurized aerated foam through the dispensing head of the dispenser.

In general, the density of the foam should be between about 0.002 and about 0.25 g/cc, preferably between about 0.01 and about 0.07 g/cc. Foam density is inversely related to foam creaminess so lower foam densities are preferred. Foam density can be controlled by regulating the air/liquid ratio of the dispenser which is preferably at least 20:1, more preferably at least 40:1. A preferred method of regulating air/liquid ratio

is by preaerating the liquid entering the liquid cylinder, for example, by introducing a small air bleed hole in the dip-tube which connects the liquid cylinder to the liquid reservoir. Thus, introducing a 0.6 mm bleed hole at a point approximately 3 mm below the first check valve (i.e. above the normal liquid level in the reservoir) increases the air to liquid ratio from approximately 20:1 up to about 50:1.

In another aspect of the invention, therefore, there is provided a pump foam dispenser comprising a liquid reservoir, dispensing means, pump means comprising synchronized liquid pump means and air pump means, and which in addition comprises liquid/air mixing means and liquid preaerating means, i.e. means for preaerating the liquid prior to its entry into the liquid pump. The synchronized liquid and air pump means preferably comprises a manually actuable, spring mounted piston tube arranged for up and down motion within a cylinder which consists of an upper air cylinder having a relatively large diameter and a lower liquid cylinder having a relatively small diameter, wherein the piston tube and air cylinder together define an air chamber of the air pump and the piston tube and the liquid cylinder together define a liquid chamber of the liquid pump.

The preaerating means preferably comprises means for aerating the foamable liquid prior to its entry into the liquid cylinder, such means preferably taking the form of an air bleed hole having a diameter of from about 0.1 to about 1 mm, preferably from about 0.4 to about 0.8 mm, the air bleed hole being set into the wall of the liquid dip tube through which liquid passes from the reservoir into the liquid chamber at a point above the normal "full" level of liquid in the reservoir. The dispenser further preferably comprises a first check valve for regulating entry of liquid into the liquid cylinder and which opens when the liquid chamber is depressurized, a

second check valve for regulating entry of air into the air cylinder and which opens when the air chamber is depressurized and a third check valve for regulating discharge of liquid from the liquid chamber and which opens when the liquid chamber is pressurized, the liquid and air being conveyed from the liquid and air chambers to an air/mixing chamber via separate air and liquid ducts.

The invention is illustrated by the following non-limiting examples.

In examples, all concentrations are on a 100% active basis and the abbreviations have the following designation:

Amphoteric A	Miranol CM - the amphoteric of formula I and/or IV in which R_1 is coconut alkyl, R_2 is H, and Z is CO_2Na.
Amphoteric B	Miranol C_2M - the amphoteric of formula I and/or in IV which R_1 is coconut alkyl, R_2 is CH_2CO_2Na, and Z is CO_2Na (cocoamphocarboxyglycinate).
Amphoteric C	Sodium N-lauryl-beta-amino propionate.
Amphoteric D	Sodium N-lauryl-beta-iminodipropionate.
Polymer 1	Hydroxyethylcellulose (HEC) Gum [Natrosol 250 HR] Molecular weight about 1,000,000.
Polymer 2	Quaternized cellulose ether (Polymer JR 400).
Anionic 1	Potassium Coco Hydrolysed Animal Protein.
Anionic 2	Palm kernal oil fatty acid sarcosinate.
Dispenser	Pre-aerated pump foamer having a synchronized air/liquid pump as discribed hereinabove and an air/liquid ratio of about 50:1.

EXAMPLES I to V

	I	II	III	IV	V
Amphoteric A	-	-	1.1	-	2.8
Amphoteric B	2.8	0.9	-	0.5	-
Amphoteric C	-	-	1.1	-	-
Amphoteric D	2.8	1.0	-	0.4	2.8
Anionic 1	-	2.7	-	-	-
Anionic 2	2.0	1.0	-	-	-
Polymer 1	0.1	-	0.1	0.26	-
Polymer 2	-	-	-	-	0.3
Glycerol	2.0	-	5.0	-	5.0
Butylene Glycol	3.0	-	-	-	-
Hexylene Glycol	-	0.2	0.4	0.1	0.6
EDTA	0.1	0.1	0.1	0.1	0.1
Trichlosan	0.3	0.2	0.2	0.3	0.2
Water	----------To 100 ----------				

The pump foamer products are made by conventional liquid mixind and dispenser filling procedures. The viscosities of the cleansing compositions of Examples I to V (Brookfield LVT, UL adapter, 70°F, 60 r.p.m. spindle speed corrected) are in the range of from 1 to 10 cps (the 60 r.p.m. correction factor is [spindle reading - 0.4] x 0.1). Foam densities are in the range from 0.02 to 0.07 g/cc.

The products display improved foam lathering characteristics (creaminess, abundance, stability) together with excellent cleansing characteristics antibacterial performance and mildness.

EXAMPLES VI to VIII

	VI	VII	VIII
Amphoteric A	-	-	1.1
Amphoteric B	0.6	0.8	-
Amphoteric C	-	-	1.1
Amphoteric D	1.7	1 5	-
Anionic 1	-	2	-
Anionic 2	-	1	-
Polymer 1	0.1	-	0.1
Glycerol	12	8	5
Ammonium Chloride	1.0	1.0	1.0
Hexylene Glycol	0.6	0.2	0.4
Propylene Glycol	3.0	4.0	2.5
EDTA	0.1	0.1	0.1
Trichlosan	0.3	0.4	0.2
Water	--------- To 100 ----------		

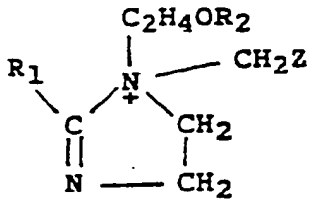
The pump foamer products are made by conventional liquid mixing and dispenser filling procedures. The viscosities of the cleansing compositions of Examples VI to VIII (Brookfield LVT, UL adapter, 70°F, 60 r.p.m. spindle speed corrected) are in the range of from 1 to 10 cps (the 60 r.p.m. correction factor is [spindle reading - 0.4] x 0.1). Foam densities are in the range from 0.02 to 0.07 g/cc.

The products display improved foam lathering characteristics (creaminess, abundance, stability) together with excellent cleansing characteristics antibacterial performance and mildness.

CLAIMS

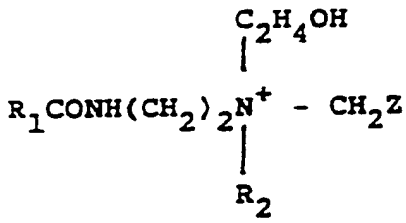
1. A foam-producing cleansing product comprising a pump-actuated non-aerosol dispenser equipped with a reservoir, dispensing head, pump means and liquid/air mixing means, wherein the reservoir contains an aqueous cleansing composition comprising:

(a) from about 0.1% to about 16% by weight of a first amphoteric surfactant selected from imidazolinium derivatives of formula I



I

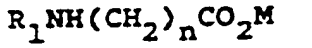
wherein R_1 is C_7-C_{22} alkyl or alkenyl, R_2 is hydrogen or CH_2Z, each Z is independently CO_2M or CH_2CO_2M, and M is H, alkali metal, alkaline earth metal, ammonium or alkanolammonium; and/or ammonium derivatives of formula IV



IV

wherein R_1, R_2 and Z are as defined above;

(b) from about 0.1% to about 16% by weight of a second amphoteric surfactant selected from aminoalkanoates of formula II



II

iminodialkanoates of formula III

$$R_1N[(CH_2)_mCO_2M]_2 \qquad III$$

and mixtures thereof, wherein n and m are numbers from 1 to 4, and R_1 and M are independently selected from the groups specified in (a) above;

(c) optionally up to about 10% of anionic surfactant; and

(d) water;

and wherein the cleansing composition has a total surfactant concentration of from about 0.2% to about 20% by weight and wherein the combined concentration of the first and second amphoteric surfactants comprises at least 20% by weight of the total surfactant concentration.

2. A cleansing product according to Claim 1 wherein the mixture of first and second amphoteric surfactants comprises at least about 50%, preferably at least about 60%, and more preferably at least about 75% by weight of the total surfactant.

3. A cleansing product according to Claim 1 or 2 wherein the total surfactant concentration is from about 1% to about 16%, preferably from about 1% to about 8% and more preferably from about 2% to about 6% by weight of the cleansing composition.

4. A cleansing product according to any of Claims 1 to 3 comprising from about 0.5% to about 10%, preferably from about 0.5% to about 4% of each of the first and second amphoteric surfactant by weight of the cleansing composition.

5. A cleansing product according to any of Claims 1 to 4 wherein the weight ratio of first amphoteric surfactant:second amphoteric surfactant is from about 10:1 to about 1:10, preferably from about 5:1 to about 1:5, more preferably from about 3:1 to about 1:3.

6. A cleansing product according to any of Claims 1 to 5 additionally comprising from about 0.1% to about 10%, preferably from about 0.5% to about 5%, more preferably from about 1% to 3% of anionic surfactant by weight of the cleansing composition.

7. A cleansing product according to Claim 6 comprising a premix or complex of the first amphoteric surfactant and anionic surfactant in an equivalent ratio of about 1:1.

8. A cleansing product according to Claim 6 wherein the anionic surfactant is a fatty acid condensation product of a protein, degraded protein or amino acid or a mixture of said fatty acid condensation products.

9. A cleansing product according to Claim 8 wherein the fatty acid condensation product is selected from

(i) condensation products of C_8-C_{12}, preferably C_{10}-C_{18} fatty acids with hydrolysed proteins,

(ii) fatty acid sarcosinates derived from C_8-C_{22}, preferably C_{10}-C_{18} fatty acids, and

(iii) mixtures thereof.

10. A cleansing product according to any of Claims 1 to 9 wherein the cleansing composition has a viscosity (Brookfield LVT, UL adaptor, 70°F, 30-60 r.p.m., speed corrected) of no more than 50cps, preferably no more than 20cps.

11. A cleansing product according to claim 10 wherein the cleansing composition has a viscosity of from about 2 to about 15, preferably from about 2 to about 12 and more preferably from about 4 to about 12 cps.

12. A cleansing product according to any of Claims 1 to 11 comprising from 0.01% to 5%, preferably from about 0.04% to about 2% and more preferably from 0.05% to 1% of polymeric thickener, by weight of the cleansing composition.

13. A cleansing product according to any of Claims 1 to 12 wherein the aqueous cleansing composition comprises from about 3% to about 40% of a hair or skin moisturiser.

14. A cleansing product according to Claim 13 wherein the moisturiser is nonocclusive and is selected from:

1. water-soluble liquid polyols;
2. essential amino acid compounds found naturally occuring in the stratum corneum of the skin; and
3. water-soluble nonpolyol nonocclusives and mixtures thereof.

15. A cleansing product according to Claim 14 wherein the moisturiser is selected from glycerin, polyethylene glycol, propylene glycol, sorbitol, polyethylene glycol and propylene glycol ethers of methyl glucose, polyethylene glycol and propylene glycol ethers of lanolin alcohol, sodium pyrrolidone carboxylic acid, lactic acid, L-proline and mixtures thereof.

16. A cleansing product according to Claim 15 wherein the moisturiser is glycerin.

17. A cleansing product according to Claim 12 wherein the polymer is a polymeric hair or skin conditioning agent which is preferably selected from cationic and nonionic polysaccharides; cationic and nonionic homopolymers and copolymers derived from acrylic and/or methacrylic acid; cationic and nonionic cellulose resins; cationic copolymers of dimethyldiallylammonium chloride and acrylic acid; cationic homopolymers of dimethyldiallylammonium chloride; cationic polyalkylene and ethoxypolyalkylene imines; quaternized silicones, and mixtures thereof.

18. A cleansing product according to any of Claims 1 to 17 additionally comprising from about 0.01% to about 5%, preferably from about 0.1% to about 4% by weight of an antibacterial agent.

19. A cleansing product according to Claim 18 wherein the antibacterial agent is selected from 3,4-di- and 3,4',5-tribromosalicylanilides, 4,4'-dichloro-3-(trifluoromethyl) carbanilide, 3,4,4'-trichlorocarbanilide, phenoxyethanol, phenoxypropanol, chlorhexidine salts, hexamidine salts, 2',4,4'-trichloro-2-hydroxy-diphenyl ether (Trichlosan), 2,2'-methylene bis (4-chloro-6-bromophenol), salicylic acid, parachlorometaxylenol, 1-hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2-(1H)-pyridone salts (Octopirox) and mixtures thereof.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US92/05135

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :A61K 31/415
US CL :424/45

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/45; 514/398

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 5, 019,572 (CLAREMON ET AL.) 28 May 1991, see the entire document.	1-3
Y	US, A, 4,371,706 (EDMONDS, JR. ET AL.) 01 February 1983, see the entire document.	1-3
A,P	US, A, 5,068,230 (REIFSCHNEIDER ET AL.) 26 November 1991, see the entire document.	1-3

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be part of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
03 AUGUST 1992	02 OCT 1992
Name and mailing address of the ISA/ Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer RAJ BAWA
Facsimile No. NOT APPLICABLE	Telephone No. (703) 308-2351

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